Sector Skills Academy

Concepts and Information for Analyzing Your Industry Sector*

Michigan Regional Skills Alliance Convening
October 3-4, 2006

Questions to start with in order to understand the role of different industries in the regional economy:

⇒ Which industries are growing and which are declining?

⇒ What is the importance of an industry to the local economy relative to its importance to the national economy?

⇒ How competitive are regional industries when compared to their national counterparts?

Tools to use to answer these questions include:

A. Quantitative analysis of employment and payroll data;

B. Qualitative research into the web of relationships in the cluster;

C. Validation with cluster employers;

D. Drawing and redrawing the map.

The remainder of this handout concerns quantitative analysis—but remember, quantitative analysis is only one tool!

Metrics for the Quantitative Analysis include...

1. *Employment and change in employment in an industry;*
   ∗ Simplest indicator of the health of a industry or sector;
   ∗ Percentage comparison between base year and current year;
   ∗ Collect for different levels of aggregation (four or five digit NAICS)

2. *Location quotients and change in location quotients;*
   ∗ A measure of an industry's concentration in an area relative to the rest of the nation.
   ∗ An industry's share of local employment divided by the industry's share of national employment.
   ∗ If the location quotient is 1, the industry's share of local employees is the same as the industry's share nationally;
   ∗ A location quotient greater than 1 means the industry employs a greater share of the local workforce than the industry employs nationally;
   ∗ A location quotient between .85 and 1.15 is considered close enough to 1 that it is not significant.

Example:

The example below uses U.S. Bureau of Labor Statistics Data and looks at a specific occupation, Medical and Clinical Lab Technicians. While the number of people employed in this position is small in relation to Rochester's overall employment, it is nonetheless high given numbers employed nationally. This occupation shows a location quotient of 2.7. This result is unsurprising as Rochester is home to the Mayo Clinic.

	Rochest, MN	National
Med/Clinical Lab Tech employment (A)	330	155,250
Total Employment (B)	99,870	130,307,840
Share of Med/Clinical Lab Techs (=A/B)	0.3%	0.1%
Location Quotient (0.3%/o.1%)	2.77	

3. *Shift share analysis;*
   * Calculates what part of local job growth can be attributed to…
     o Growth in the national economy;
     o Growth in the sector nationally;
     o Growth from local competitive advantage as compared to growth nationally.
   * It does not tell the researcher why the industry added or lost jobs.

Thus, in this analysis, if an occupation loses or gains employment from one year to the next, the shift-share analysis breaks down that gain as follows:
Change in employment = share attributable to growth in national economy + share attributable to growth in the sector national + share attributable to local competitive advantages.

Example:

	2005		2004		Employment Difference (2005 – 2004)	
	Rochest, MN	National	Rochest, MN	National	Rochest, MN	National
Med/Clinical Lab Tech employment	330	155,250	360	141,720	(30)	13,530
Total Employment	99,870	130,307,840	87,420	128,127,360	12,450	2,180,480

From the data in the table above, one can see that Rochester lost 30 jobs in the Medical and Clinical Lab Tech occupation from 2004 to 2005. This loss in jobs would be divided up as follows:
share change + mix change + shift change = Total change in employment
6.13 + 28.24 + (64.37) = (30)
That is, the loss of 30 jobs took place despite growth in the national economy generally, as well as growth in the sector nationally.

Formula:
For the mathematically inclined, the formula to calculate the shift share numbers shown above is represented below, as follows:

$$e_i^{t+n} - e_i^t = e_i^t \left[\frac{E^{t+n}}{E^t} - 1 \right] + e_i^t \left[\frac{E_i^{t+n}}{E_i^t} - \frac{E^{t+n}}{E^t} \right] + e_i^t \left[\frac{e_i^{t+n}}{e_i^t} - \frac{E_i^{t+n}}{E_i^t} \right]$$

Where:
E^t is total national employment in the first year (below in 2004)
E^{t+1} is total national employment in the second year (below in 2005)
E_i is national employment in the sector
The lower case e refers to the numbers employed locally, with super scripts to indicate which time period and subscript to denote whether the employment relates to the sector.

4. *Payroll per employee by industry and change in payroll per employee.*
   * One of the simplest measure of the quality of jobs in a given industry;
   * Payroll by industry divided by employment by industry;
   * Can be extended to look at payroll per employee over time or in comparison to national payroll per employee figures for the industry.

Sources of Data for Analysis

U.S. Department of Labor, Bureau of Labor Statistics http://www.bls.gov
* Occupational Employment Statistics http://www.bls.gov/oes/home.htm

US Census Bureau http://www.census.gov
* Economic Census http://www.census.gov/econ/census02/
*Local Employment Dynamics Program Provides data on Quarterly Workforce Indicators (QWIs), as well as a host of other employment data on workers in different industries, age, and sex groups http://lehd.dsd.census.gov/led/

Michigan's Regional Skills Alliances, Department of Labor and Economic Growth
*Research and Reports http://www.michigan.gov/rsa/0,1607,7-210-30508---,00.html

Michigan's Bureau of Labor Market Information & Strategic Initiatives
*Labor Market Information http://www.michlmi.org/

Michigan's History, Arts, and Libraries
*Social and Economic Data Sources: http://www.michigan.gov/hal/0,1607,7-160-17451_28396---,00.html